

Digital Innovation and Efficiency Committee

Item No.

Report title:	Agritech
Date of meeting:	23rd January 2019
Responsible Chief Officer:	Executive Director, Finance and Commercial Services
Strategic impact Use of technology in agriculture must evolve to embrace new technological opportunities in order to increase the competitiveness and profitability of Norfolk's agricultural sector.	

Executive summary

Wikipedia defines Agri-tech as the use of technology in agriculture, horticulture, and aquaculture with the aim of improving yield, efficiency, and profitability.

Agri-tech incorporates such technology as drones, self-driving vehicles (such as tractors), sensors, livestock and equipment tracking, precision control of heating, lighting, watering, pesticides and fertilisers.

Agri-tech has been identified by the Government as of national importance and one of the world's fastest growing markets. Norfolk's expertise in food, plant and health science, combined with an innovative farming community, offers business extraordinary potential to contribute to that growth.

In 2013 (when last surveyed by UK Government) the agri-tech sector contributed £14 billion to the UK economy and is growing rapidly. Gartner claims that at present less than 10% of farms are exploiting agri-tech, but that this will "grow" to 50% by 2025.

When surveyed in 2018 over 70% of East Anglian farmers and landowners were reported to be exploring the use of agri-tech in future farming plans.

Norfolk is home to a number of world class capabilities in agri-tech and the related areas of food and life science.

"Brexit" may well result in reduced availability of itinerant labour and so agri-tech will present an important opportunity to cope with this risk.

Norfolk County Council Operates County Farms, which is the 2nd largest estate in the county after Holkham estate, therefore agri-tech offers the County Council and its tenants an opportunity to increase our productivity and profitability.

Recommendations:

1. To note the information provided in this report.

2. To direct officers to further investigate the opportunity to promote the use of agri-tech across the County Farms estate.

1. Background

- 1.1. Although tools and technology have always been used in farming and agriculture, modern “Internet of Things” (IoT) sensors, low cost drones, low cost big data systems, cloud services and a healthy, competitive supplier market mean that agri-tech is now able to make a real difference to the effectiveness of the industry.
- 1.2. The likely reduction in access to cheap seasonal labour due to “Brexit” means that Norfolk farmers will be under increased pressure to look to technological automation in order to cope in future. Evolving legislation appears conducive to the adoption of agri-tech in farming.
- 1.3. The uptake of Agri-tech in Norfolk has already started. In a recent EDP publication, Chris Hill reported that “Farmers and landowners in East Anglia are embracing new technology and diversification in a bid to future-proof their business ahead of Brexit, according to a survey of rural professionals. Of those surveyed... 71% said clients were exploring the use of agri-tech in future farming plans.
- 1.4. The pace of change in the sector is accelerating such that Norfolk’s farmers and landowners will need to adapt and adopt new technologically enabled approaches or risk being left behind by their competitors.
- 1.5. Back in 2013 (the latest year for which data was available), the agri-tech sector contributed £14.3 billion to UK Gross Value Added and employed over half a million people. Agri-tech output grew by 16% between 2008 and 2013, however, this masks the rapid growth of some sub-sectors over the period. The animal sub-sector, environment and physical sub-sector, and ICT and decision support sector have all grown at more than 20%.

2. Precision Farming

- 2.1. One of the fastest growing agri-tech subsectors is expected to be precision farming and engineering. It’s already (in 2013) worth over £1 billion to the UK economy and employs 21,000 people.
- 2.2. Agricultural robotics are now being developed to drive tractors, kill weeds with lasers to avoid using chemicals, pick and grade strawberries, mow grass, scout for pests, weeds and diseases and plant seeds. This new wave of smart machines is set to revolutionise the way in which crops are grown in the future by using intelligently targeted inputs. Hi-tech areas like this are expected to expand as the core agriculture sector continues to seek efficiency improvements and adopts new technologies.
- 2.3. Drones are also being used to provide overhead views of farms and to target the use of chemicals such as pesticides and fertiliser to specific areas where they are needed rather than across much wider areas.

3. IoT / Sensors, Networks

- 3.1. While reviewing the “Internet of Things (IoT) opportunities for the Digital Committee in 2018, a number of agri-tech examples were referenced relating to such areas such as: crops and livestock, buildings, vehicles and equipment, product processing, manufacturing, and distribution. A few examples are listed below.
- 3.2. Heard tracking – sensors ingested by cows (and other livestock) that track the location of the heard and also provide advanced warning of impending ill health by measuring and transmitting their temperature.
- 3.3. Sensors in the soil that measure and report on moisture, temperature and chemical levels to inform the need for watering or drainage, pesticides, fertilisers etc. This can allow actions to be targeted to specific areas of a farm, field or crop.
- 3.4. Sensors which detect movement can be connected to high value machinery such as combine harvesters to provide early warning is they are being tampered with or moved, thereby reducing the risk of theft.
- 3.5. Sensors and linked systems in buildings to control lighting, humidity, temperature, air quality, automated feeding, watering and harvesting in relation to crops or livestock.
- 3.6. Sensors need to communicate over networks and the lack of continuous, ubiquitous connectivity to cellular (mobile phone) networks in some rural areas has been highlighted as a barrier to adoption. Norfolk’s existing LoRaWAN (low power wide area radio network) can provide an easy to access low cost alternative for Norfolk’s farming community as an alternative to use of mobile telephony infrastructure (where it is available). Norfolk County Council is currently bidding for capital funding from the New Anglia LEP to extend the LoRaWAN coverage across the whole of the county (and Suffolk).

4. County Farms

- 4.1. Norfolk’s County Farms Estate extends to over 6,800 hectares of prime agricultural land and has 145 tenants.

The estate provides significant income for the Council, which helps to pay for services and to meet our ongoing sustainable development commitments by:

- Providing a framework for local produce, goods and services
- Sustaining and creating rural employment
- Developing business opportunities throughout the County
- Improving and developing access for recreation and education
- Creating and improving biodiversity
- Providing land for affordable housing

- 4.2. Officers managing County Farms Estate have agreed that we should (a) investigate our current use of agri-tech and (b) engage with our regional expert organisations to see how we can raise awareness and deploy agri-tech solutions to increasing productivity and profitability.

5. Support for Agri-tech Take-Up in Norfolk

- 5.1. IMT Officers attended the Royal Norfolk Show in June 2018 to introduce 'The Things Network' and LoRaWAN as part of the Norfolk County Council stand.

We noted a significant presence by agri-tech vendors at the show and Agritech-East www.agri-tech-east.co.uk which is "a local independent, member-led organisation catalysing innovation in agriculture and horticulture".

- 5.2. Agri-tech-East is one of a number of credible organisations providing access to conferences, online materials, networking and awareness raising in the Norfolk area. Others include the Eastern Daily Press (EDP), Savilles, the Royal Norfolk Agricultural Association, The Chamber of Commerce & the New Anglia LEP.

- 5.3. Agri-tech Grants are highlighted on the New Anglia LEP's website, stating:

The Eastern Agri-tech Growth Initiative supports the development of new and innovative ideas within this important sector. The Agri-Tech Growth Fund provides grants between £10,000 and £150,000 to support product development and improve agricultural productivity.

- 5.4. In the document "A Growth Prospectus for Norfolk", produced by the Norfolk Growth Group the Norwich Research Park & UEA facilities are described as follows.

A world class agri-tech and life science skills base... Norfolk's expertise in food, plant and health science, combined with an innovative farming community, offers business extraordinary potential to contribute to that growth. Norwich Research Park (NRP) houses a unique cluster of organisations in the vanguard of global food and health research, including food security, healthier and more nutritious food, resilient crops and industrial biotechnology. The Park is home to six leading research organisations employing over 3000 scientists (12,000 staff) at the John Innes Centre, Institute of Food Research, Sainsbury Laboratory, the Genome Analysis Centre and University of East Anglia (UEA).

6. Financial Implications

- 6.1. There are no immediate financial implications arising from this report. However, increased uptake of agri-tech solutions across county farms tenants could increase their income and help protect ours. There are also significant business growth opportunities arising from the increased take-up of agri-tech across Norfolk's agricultural industries.

7. Issues, risks and innovation

- 7.1. The adoption of some agri-tech solutions is a low risk activity with potential regional and national grants available to further de-risk the investment. The greater risk is perhaps to fail to adapt and adopt the new technologies and risk going out of business if our agricultural industry becomes uncompetitive. Some of the latest approaches are highly innovative and might represent a much higher risk. Each investment would require its own invest to save business case and associated risk assessment.

Officer Contact

If you have any questions about matters contained in this paper or want to see copies of any assessments, eg equality impact assessment, please get in touch with:

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